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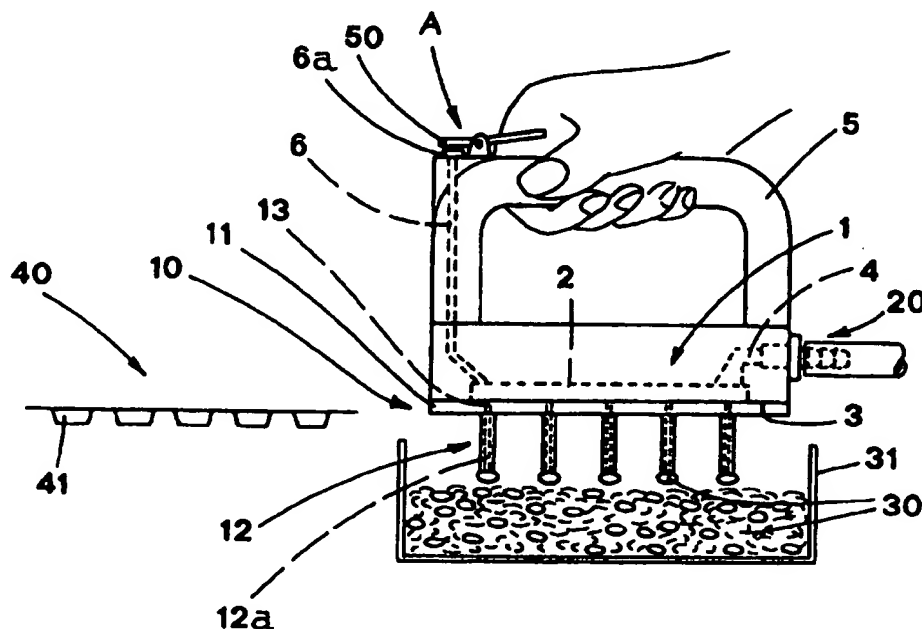
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(54) Title: DEVICE FOR INSERTING PRODUCTS INTO POCKETS OF A BLISTER BAND



## (57) Abstract

A device for filling the pockets (41) of a blister band, with respective products (30), such as tablets, capsules and the like, includes a body (1) with a cavity closed by a plate (11) secured to the bottom of the body to form a chamber (2), and control means (50) which enable to maintain a negative pressure into the chamber. The plate (11) is provided with perforated projections (12a) connected with the chamber (2) and aimed at holding products (30), which are picked up from a container (31) and placed into the pockets (41). As an alternative, instead of the projections (12), a plurality of recesses (62) are provided and connected to the chamber (2).

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DEVICE FOR INSERTING PRODUCTS INTO POCKETS OF A  
BLISTER BAND

5 TECHNICAL FIELD

The present invention relates to a device for  
inserting products, such as tablets or capsules,  
into the pockets of a blister band that is then  
10 subdivided to form blister packs.

BACKGROUND ART

15 It is known that manufacturing of packages,  
commonly known as blister packs, includes: in a  
special moulding station one or more rows of pockets  
are formed on a band of suitable material, usually  
thermoformable plastic material; then the pockets  
20 are filled with products; the side of the band where  
the pockets open, is covered with a sheet of  
aluminium foil sealed thereto. Then the band is  
divided into a plurality of portions each one  
including a predetermined number of pockets, and  
25 products.

The process as above described is usually  
adopted for mass production, with completely  
automatised techniques and machines with very high  
throughput and low costs for the process.

30 However, sometimes a limited quantity of  
packages is requested for a certain product. This  
is, for instance, when tests must be carried out on  
blister packs with new configurations or with new  
materials other than the ones previously used, or  
35 also when the pockets must be filled with articles  
which have various shapes, sizes or compositions.

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Generally, such limited quantity is produced on special production lines, in which the pockets are filled manually.

The thermoforming station includes a mould  
5 that forms the pockets with predetermined dimensions, generally rather expensive and complex to be set up. Problems arising from limited quantity production, cause frequent mould replacements so as to form pockets of different shape and size that fit  
10 products to be introduced therein.

Nowadays the trend, intended to reduce production cost and time, is to use only one mould for forming pockets big enough to hold any kind of product.

15 This, however, requires presence of an operator near the blister band, who picks up a predetermined quantity of products from one or more containers, and introduces them manually into the pockets while the band is advanced. The operator can  
20 control the band advancement speed in accordance with his own capability.

Drawbacks of manual operation are due to the repetitive and monotonous picking up and placing the individual products, which gradually makes the  
25 operator tired and makes him lose the constant work rhythm which results in frequent slowdowns or stops of the band.

The continuity of the process is instead necessary for effective operation of the apparatus  
30 for sealing the pockets.

#### DISCLOSURE OF THE INVENTION

35 The object of the present invention is to propose a device for inserting products in the

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pockets of a blister band, that makes it possible for the operator to pick up a predetermined quantity of products from a container and to introduce them quickly into respective pockets, in a simple and practical way and assuring that each pocket will be filled with only one product.

Another object of the invention is to propose a device simple, inexpensive and easy to install and maintain.

The above mentioned objects are obtained by means of a device for inserting products in a blister band, that includes a body provided with a handle and featuring an inner hollow chamber and vacuum suction generating means, aimed at causing a negative pressure inside said chamber. Pick up means are secured to the body and connected to the chamber.

Control means can be acted upon by the operator to keep said chamber in negative pressure condition or to reset atmospheric pressure condition therein, so that products can be picked up, due to vacuum suction action, from a container and placed into the pockets of a blister band.

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#### BRIEF DESCRIPTION OF THE DRAWINGS

The characteristic features of the present invention are pointed out in the following description with reference to the enclosed drawings, in which:

- Fig. 1 is a schematic top view of a blister band and of an inserting device made according to this invention, during the step, in which the products are picked up from a container;
- Fig. 2 is a top view of the same device during the

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filling step;

- Fig. 3a is a schematic side sectional view of a first embodiment of the device taken along the line III-III of Fig. 1;
- 5 - Fig. 4a is a side sectional view of this device taken along the line IV-IV of Fig. 2;
- Fig. 3b is a schematic lateral sectional view of a second embodiment of the device taken along the line III-III of Fig. 1;
- 10 - Fig. 4b is a side sectional view of this device taken along the line IV-IV of Fig. 2;
- Fig. 5 is a schematic side sectional view of another version of the device;
- Fig. 6 is a view of this device during the step,
- 15 in which the exceeding products are expelled;
- Fig. 7 is a view of the above mentioned version of the device in the filling stage.

## 20 BEST MODES OF CARRYING OUT THE INVENTION

With reference to Figs. 1, 3a, and 3b, reference numeral 1 indicates the body of the subject device.

- 25 The body 1 has a parallelepipedal shape and features a handle 5 in its upper part and a cavity in its lower part.

The cavity is closed by pick up means 10 secured to the bottom 3 of the body 1, so as to  
30 define a closed chamber 2.

According to a first embodiment, the pick up means 10 include a removable plate 11, provided with a plurality of longitudinally perforated projections 12, basically of cylindrical shape, fastened to its  
35 outer side and connected to the chamber 2 by means of holes 13 made in the plate 11.

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The chamber 2 communicates also with vacuum suction generating means 20 that cause a negative inside the chamber 2.

The vacuum suction generating means 20 include a  
5 conduit 4 connected to the chamber 2 and to a vacuum source, known and not shown, and an outlet 6 that opens outside the body 1, close to the handle 5.

Normally, the outlet 6 is closed at its outside rim 6a by control means 50.

10 The control means 50 include a valve that can be manually shifted to an operative position A (Fig. 3a), in which it closes the outlet 6a, and a release position B (Fig. 4a), in which the outlet 6 is open so as to connect the chamber 2 with the atmosphere.

15 The projections 12 keep the products 30 at their lower end 12b, due to the suction action resulting from the negative pressure in the chamber, picking them up from a container 31, in which the products are in bulk.

20 The vertical projections 12 are arranged on the plate 11 like groups 42 of pockets 41 on the blister band 40, e.g. two adjacent groups (see Figure 2).

In a second embodiment, the vacuum suction  
25 generating means 20 include a conduit 70, made in the body 1. At one end, the conduit 70 is connected to a compressed air supply 71, made inside the handle 5, by means of a connecting member 72. The opposite end of the conduit 70 opens outside.

30 The conduit 70 features also a necking 70a, that connects it with the chamber 2, and is shaped in such a manner as to cause Venturi effect, i.e. suction of air from the chamber 2, when an air flow passes through the necking 70a in direction X (Fig.  
35 3b).

The control means 50, are situated between

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the supply 71 and the connecting member 72, and include a push button 51, connected to a discharge valve 52. The valve 52 is usually in an operative position A in which a vent conduit 73 is obstructed.

5       The vent conduit 73 communicates with outside and forms a way of low resistance for compressed air coming from the supply 71.

          The push button 51 is operated manually to set the valve 52 in a bypass position B (Fig. 4b),  
10       in which the valve lets the air flow free through the vent conduit 73 and prevents it from flowing towards the shaped conduit 70.

          According to another version of the present invention, the pick up means 10 include a plate 61  
15       provided with a plurality of recesses 62, designed to hold a plurality of products 30 (see Figs. 5, 6 and 7).

          The recesses 62 are connected to the chamber 2 by means of respective holes 63 made in the plate  
20       61 and having diameter smaller than the minimum dimension of the products 30.

          Obviously, the plate 61, described in the above version, can be also applied to the device prepared according to both embodiments, first and  
25       second, previously disclosed.

          Operation of the device for inserting products 30 into correspondent pockets 41 is now described, as far as the first embodiment is concerned, and with reference to Figs. 1, 2, 3a and  
30       4a.

          The operator works near the blister band 40, that moves basically with regular continuous motion, coming from a previous thermoforming station of the pockets 41.

35       Near the operator, there is also situated one or more containers 31 with products 30 (Fig. 1) and



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the device, being the subject of the present invention.

The vacuum suction source is continuously active, and the push button valve 50 is in its operative position A.

In this way, the push button valve 50 closes the outlet 6 and makes it possible to create depression in the chamber 2.

The operator performs a repetitive series of filling cycles, in each of which the device is brought in the container 31, so that the projections 12 contact the products 30 and keep some of them due to depression (Fig. 3a).

The operator manually eliminates possible excessive products 30 that have been kept by each projection 12, and put the products 30 on the projections 12 that lack them.

Immediately afterwards, the operator carries the device on the moving blister band 40, until the projections 12 match the first groups 42 of empty pockets 41 (Fig. 2).

Then, the valve 50 is brought to the release position B, so as to connect the chamber 2 with the atmosphere.

This brings the pressure inside the chamber 2 and, consequently causes the release of the products 30 inside the respective pockets 41 (Fig. 4).

Then the operator brings the push button valve 50 back to the position A and the device into the container 31, to begin a new filling cycle.

In the second embodiment of the device, compressed air is supplied continuously by the supply 71 (Fig. 3b).

When the push button 51 is in operative position A, the supply 71 is not connected with the vent conduit 73, therefore compressed air flows

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through the connecting member 72 and then through the shaped conduit 70.

A depression is generated, due to Venturi effect, in the necking 70a of the shaped conduit 70 and, consequently, in the chamber 2 that is connected therewith.

When the device is in the container 31 and in contact with the products 30, the latters are sucked, by the projections 12 and kept by their terminal ends.

The operator acts upon the push button 51, making the supply 71 be connected with the vent conduit 73, and lets the compressed air free so that the Venturi effect in the shaped conduit 70 is no longer effective.

As a consequence, the pressure inside the chamber 2 returns to value similar to atmospherical pressure that causes the release of products 30, due to gravity force, which fall into the pockets.

The operator performs filling cycles exactly as in the first embodiment, previously described. In the previously mentioned version, the operator preferably begins the working cycle by turning the device upside down (see Fig. 5) and depositing on the plate 61 a quantity of products 30 bigger than the quantity of recesses 62, made in the plate 61, in order to assure that all of them are filled.

Also in this case, only one product 30 is held in each recess 62. Afterwards, the device is brought back to its operative position, allowing the exceeding products 30 to fall inside the container 31 (Fig. 6).

At this point, the operator carries the device toward the blister band 40 to insert the products 30 into the pockets 41 to be filled (Fig. 7).

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The advantage of the present invention is particularly the fact that the operator is much more effective in filling the pockets 41, because he must carry out a series of actions that are repetitive  
5 but need less attention with respect to the operations relative to manual filling of each separate pocket, reduce the operation rate and consequently, the operator's tiredness.

The device can be quickly adapted to the  
10 change of the arrangement of the pockets 41 or of the size of the products 30, by replacing the plate 11, 61 with another one of different shape.

All this is obtained by a simple and cheap device of easy use and maintenance.

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CLAIMS

1. Device for inserting products in a blister band, characterised in that it includes:
- 5 a body (1) provided with a handle (5) and featuring an inner hollow chamber (2); vacuum suction generating means (20) that cause a negative pressure inside said chamber (2); control means (50) which can be operated by the user
- 10 to keep said chamber in negative pressure condition or to reset atmospheric pressure condition therein; pick up means (10) secured to the lower surface (3) of said body (1) and connected to said chamber (2), for allowing the user, in cooperation with said
- 15 control means (50), to pick up, by means of vacuum suction action, a plurality of products (30) from a container (31), and to place them into respective pockets (41) of a blister band (40).
- 20 2. Device according to claim 1, characterised in that said pick up means (10) include at least a plate (11), provided with a plurality of longitudinally perforated projections (12), basically with cylindrical shape, fastened to its
- 25 outer side and connected to said chamber (2) by means of respective holes (13) made in said plate (11).
3. Device according to claim 2, characterised in
- 30 that said projections (12) are arranged on said plate (11) like at least a group (42) of pockets (41) on said blister band (40).
4. Device according to claim 1, characterised in
- 35 that said vacuum suction generating means (20) include at least a conduit (4) connected to said

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chamber (2) and to a vacuum source, and a outlet (6) that connects said chamber (2) with the atmosphere when enabled by said control means (50).

5 5. Device according to claim 4, characterised in that said control means (50) include a push button valve that can be manually shifted to an operative position (A), in which the outlet (6) is closed, and  
10 a release position (B), in which said outlet is open.

6. Device according to claim 1, characterised in that said vacuum suction generating means (20) include at least a shaped conduit (70), made  
15 internally in said body (1), and connected to a compressed air supply (71), by means of a connecting member (72), and also connected to said chamber (2) via a necking (70a), said chamber being set alternatively in negative pressure condition, due to  
20 Venturi effect, and in atmospheric pressure condition by said control means (50).

7. Device according to claim 6, characterised in that said control means (50) include a push button  
25 (51), connected to a discharge valve (52), that can be set in an operative position (A), in which a vent conduit (73) is obstructed, and a bypass position (B), in which the valve connects said vent conduit (73) with said shaped conduit (70).

30

8. Device according to claim 1, characterised in that said pick up means (10) include at least one plate (61) provided on its outer side with a plurality of recesses (62), into which products (30)  
35 can be held and which are connected to said chamber (2) by means of respective holes (63) made in said

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plate (61).

9. Device according to claim 8, characterised in  
that the said recesses are arranged on said plate  
5 (61) like at least a group (42) of pockets (41) on  
said blister band (40).

10. Device according to claim 2 or 8, characterised  
in that said plate (11,61) can be changed over with  
10 another suitable for products (30) with different  
size.

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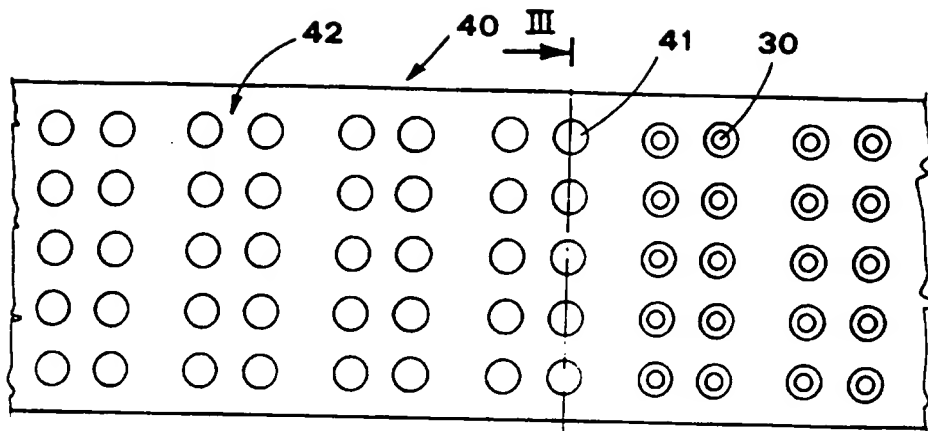


FIG. 1

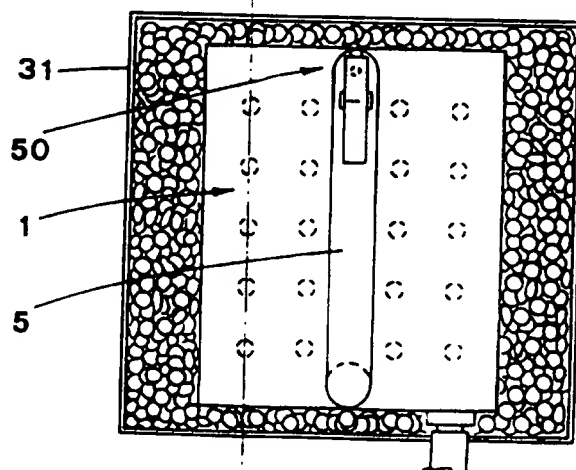
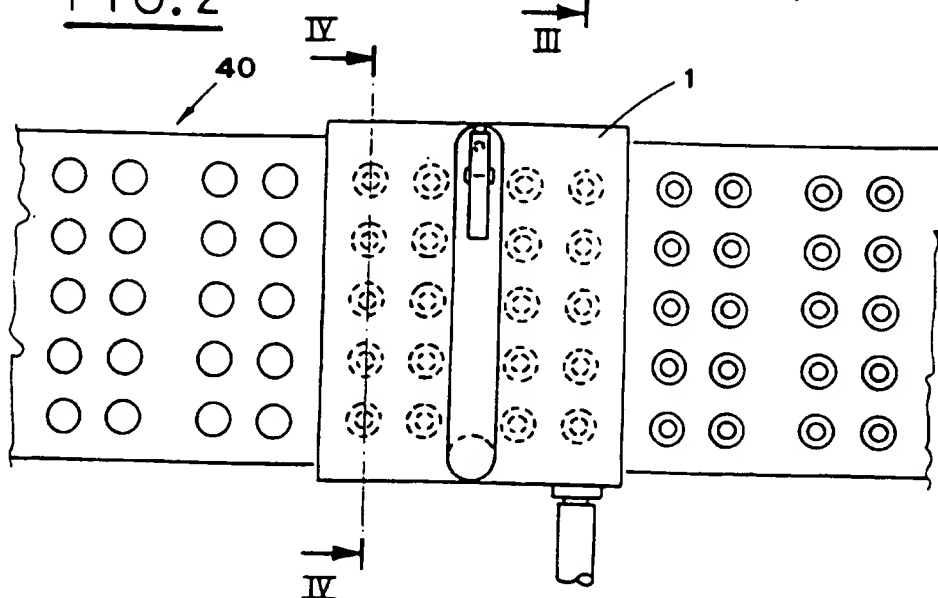
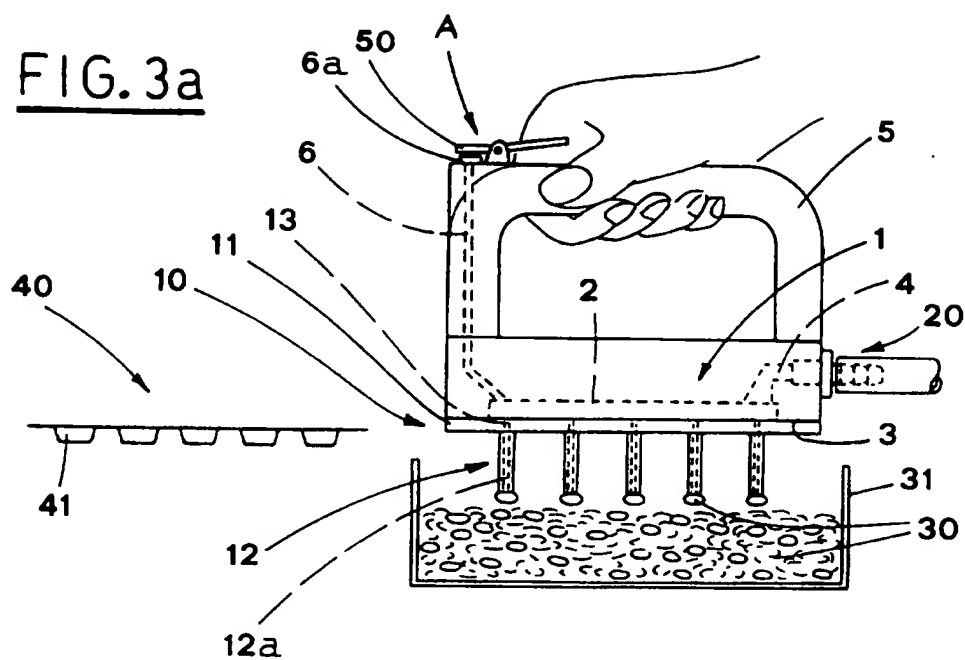
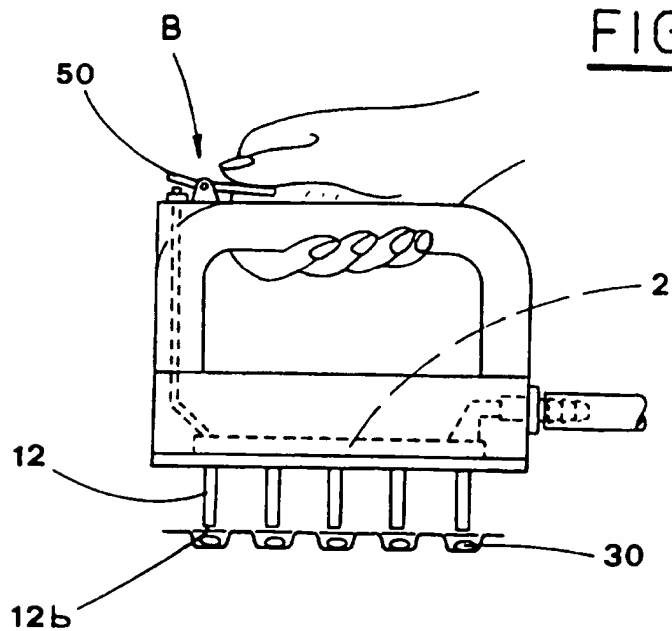


FIG. 2

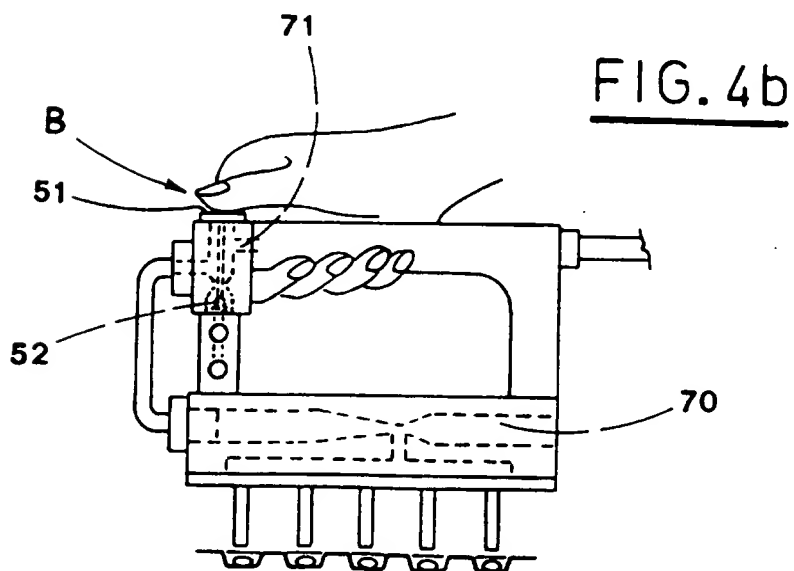
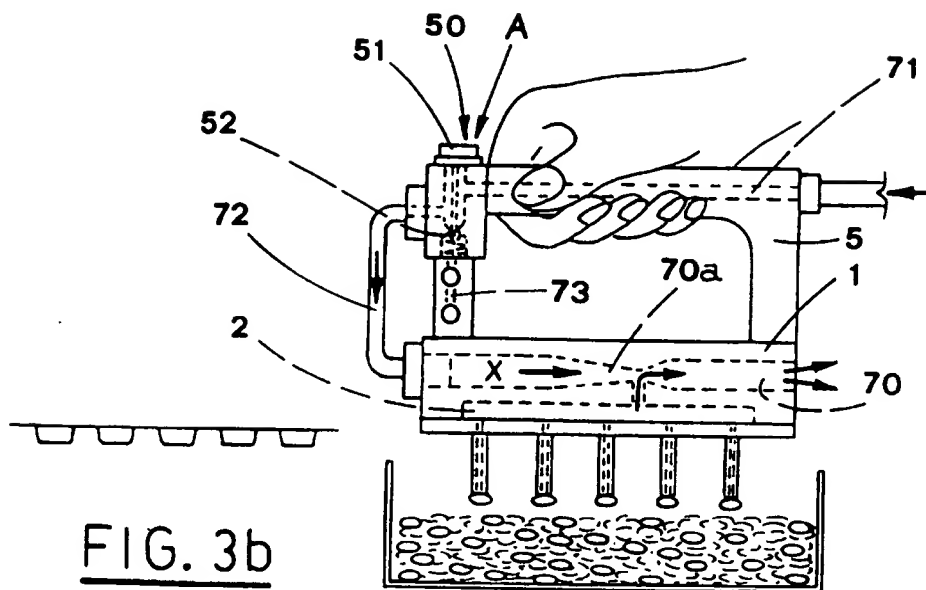


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FIG. 3aFIG. 4a



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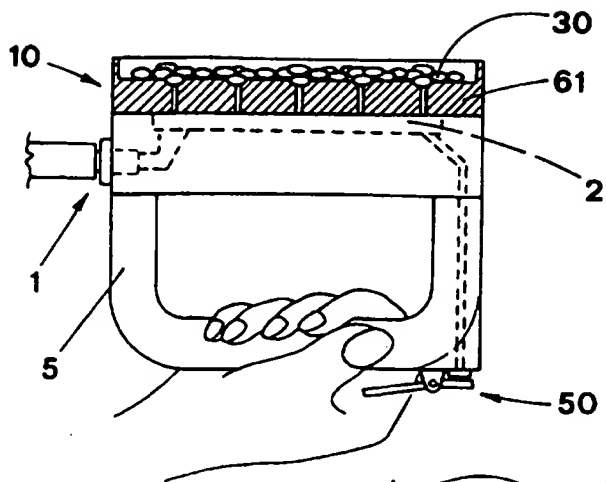


FIG. 5

FIG. 6

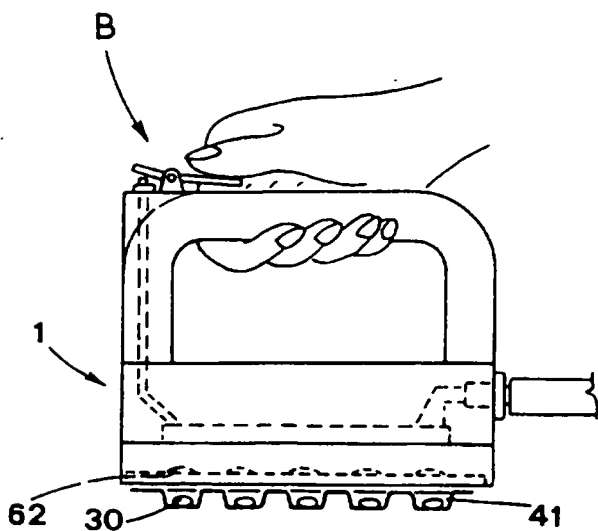
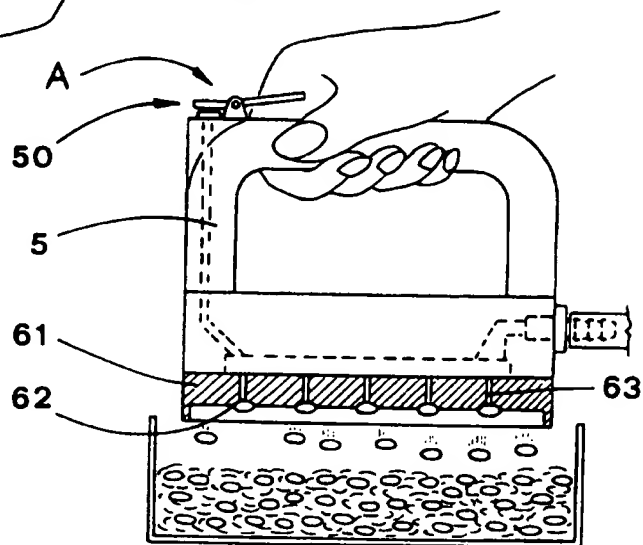


FIG. 7

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/IB 95/01085

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 6 B65B35/38

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 B65B B65G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US,A,4 026 091 (W.G. PEARSON) 31 May 1977 see the whole document	1,4
A	---	5,8-10
A	US,A,4 950 016 (V.S. KUMAR) 21 August 1990 see abstract; figure 1 -----	6

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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13 March 1996

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Information on patent family members

International Application No

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A-4026091	31-05-77	NONE	
US-A-4950016	21-08-90	NONE	